I Claim

1. In a starter generator having a body said body having a first end and a second end and a side wall between said ends, said side wall having a plurality of vents adjacent the first end of said body, said first end having an end bell connected thereto and a commutator head assembly connected to said second end, and a fan cover assembly connected to said commutator head assembly, the improvement comprising said end bell having a bearing liner, said bearing liner having a rim extending therefrom toward said first end of said body such that said rim does not block any portion of a vent in said body, said end bell being adapted to be connected to a helicopter body.

2. In a starter generator having a body said body having a first end and a second end and a side wall between said ends, said side wall having a plurality of vents adjacent the first end of said body, said first end having an end bell connected thereto and a commutator head assembly connected to said second end, and a fan cover assembly connected to said commutator head assembly, the improvement comprising said end bell having a bearing liner, said bearing liner having a support extending therefrom toward said first end of said body such that said support does not block any portion of a vent in said body, said end bell being adapted to be connected to a helicopter body.

3. The starter generator according to claim 1 wherein said end bell is generally disk shaped and has a top surface and a bottom surface said top and bottom surfaces being connected by a sidewall, said top and bottom surfaces having a plurality of orifices for providing clearance for bolts on a helicopter said end bell having more orifices in said top and bottom surfaces than those orifices that are required for connecting said starter motor to said helicopter, said additional orifices providing increased ventilation for brushes in said commutator head

assembly.

4. The starter generator according to claim 2 wherein said end bell is generally disk shaped and has a top surface and a bottom surface said top and bottom surfaces being connected by a sidewall, said top and bottom surfaces having a plurality of orifices for providing clearance for bolts on a helicopter said end bell having more orifices in said top and bottom surfaces than those orifices that are required for connecting said starter motor to said helicopter, said additional orifices providing increased ventilation for brushes in said commutator head assembly.

5. The starter generator of claim 2 wherein the support has an upper surface generally parallel to said bottom surface of said end bell and a pair of side walls.

6. The starter generator according to claim 5 wherein are generally perpendicular to said upper surface.

7. The starter generator according to claim 5 wherein the side edges are curved.

8. The starter generator according to claim 5 wherein the upper surface of said support has a length of approximately .5"

9. The starter generator according to claim 8 wherein the support has a height in the range of about .135" to .155".

10 A starter generator according to claim 1 wherein the starter generator has one or more brushes that comprise the following percentages by weight

Boron <0.002

Iron < 0.015

Copper <0.002

Molybdenum <0.002

Magnesium <0.02

Silicon < 0.015

Silver <0.60

Aluminum <0.002

Calcium <0.15

Phosphorous <0.02

Sulfur <0.02

Potassium <0.02

Nickel <0.002

Cobalt <0.002

Manganese <0.002

Titanium <0.002

Vanadium <0.002

Zinc <0.02

Lead <0.02

Lithium < 2.0

Lithium carbonate < 5.0

and wherein the remainder is carbon.

11. A starter generator having one or more brushes wherein the brushes comprise the following percentages by weight:

Boron <0.002

Iron < 0.015

Copper <0.002

Molybdenum <0.002

Magnesium <0.02

Silicon < 0.015

Silver <0.60

Aluminum <0.002

Calcium <0.15

Phosphorous <0.02

Sulfur <0.02

Potassium <0.02

Nickel <0.002

Cobalt <0.002

Manganese <0.002

Titanium <0.002

Vanadium <0.002

Zinc <0.02

Lead <0.02

Lithium < 2.0

Lithium carbonate < 5.0

and wherein the remainder is carbon, said starter generator being adapted for use in a helicopter.

12. The starter generator according to claim 2 wherein the starter generator has one or more brushes that comprise the following percentages by weight

Boron <0.001

Iron ≤0.01

Copper <0.001

Molybdenum <0.001

Magnesium <0.01

Silicon ≤ 0.01

Silver ≤ .56

Aluminum <0.001

Calcium <0.10

Phosphorous <0.01

Sulfur <0.01

Potassium <0.01

Nickel <0.001

Cobalt <0.001

Manganese <0.001

Titanium <0.001

Vanadium <0.001

Zinc <0.01

Lead <0.01

Lithium < 1.0

Lithium carbonate < 4

and wherein the remainder is carbon.

13. The starter generator according to claim 11 wherein the percentage of Lithium by weight is about 0.50 to 0.60.

14. The starter generator according to claim 13 wherein the percentage of Lithium carbonate by weight is about 3.00 to 4.00.

15. The starter generator according to claim 1 further comprising a brush spring having a tension on a commutator of less than 40 ounces.

16. The starter generator according to claim 15 wherein the brush spring has a tension on the commutator of less than 28 ounces.

17. The starter generator according to claim 1 wherein a brush spring has a tension on a commutator of less than 20 ounces.

18. A starter generator comprising

a body having a first end and a second end having an end bell at said first end,

a commutator head assembly at said second end and

a fan cover assembly on said commutator head assembly opposite said body said starter generator being adapted to be connected to a helicopter, and

wherein there are one or more brushes in the starter generator and wherein the pressure exerted by a brush spring on a commutator is in the range of about 90 to 150 oz./sq.in.

19. The starter generator according to claim 18 wherein the pressure exerted by said brush spring is in the range of about 100 to 130 oz./sq.in,

20. The starter generator according to claim 19 wherein the pressure exerted by said brush spring is in the range of about 110-125 oz./sq.in,

21 The starter generator according to claim 18 having a horsepower greater than two.

22. The starter generator according to claim 21having a horsepower greater than four.

23. The starter generator according to claim 22 having a horsepower greater than five.